

REMARKS/ARGUMENTS

Summary of Amendments

The present application contains 28 claims.

Dependent claims 4, 9, 15 and 16 have been amended in order to clarify the subject matter being claimed.

Rejections under 35 U.S.C. § 112

At the end of page 2 and the beginning of page 3 of the outstanding Office Action, the Examiner has rejected claims 4 and 16 under 35 U.S.C. § 112 as being unclear because of the use of the term “substantially” which would be indefinite.

To overcome this rejection, the Applicant has amended these two claims by removing the expression “is substantially free of water” and by specifying that the semi-solid phase has a residual water content of less than about 10 weight %.

The Applicant respectfully submits that support for the above amendment exists in the specification as originally filed and that no new matter has been added. In this connection, the Examiner may refer to page 7, § [0023] of the specification as filed, which fully supports the amendment made to claims 4 and 16.

At the end of page 2 and the beginning of page 3 of the Office Action, the Examiner has also rejected claim 9 under 35 U.S.C. § 112 as being unclear

because there would have no sufficient antecedent basis for the expression "said solid material".

To overcome this rejection, the Applicant has replaced the expression "recovering said solid material" by the expression --recovering a solid material from said semi-solid phase--. Such is in conformity with the wording of claim 15 as originally filed.

Moreover, the Applicant has amended of step c) claim 15 by replacing the expression "said solid-material" by the expression --said semi-solid phase--. Such is in conformity with the wording of step b) of the same claim.

Rejection under 35 U.S.C. § 102(b)

On page 3 of the Office Action, the Examiner has rejected claims 1-3, 7, 11-14 as being anticipated by U.S. Patent No. 5,770,749 (hereinafter referred to as KUTNEY *et al.*)

The Applicant respectfully contests this rejection for the following reasons.

First of all, it is worth reminding that the present invention as recited in claim 1 is directed to a process for isolating a phytosterol from pulp soap by first treating the soap with a solvent which may be propan-2-one or methanol or a mixture thereof to obtain a liquid phase and a semi-solid phase containing the phytosterol. After separation of the liquid phase and the semi-solid phase, the phytosterol is extracted from the semi-solid phase using a solvent chosen amongst C₃-C₆ ketones, C₁-C₆ alkanols and mixtures thereof. In other words, the present invention is directed to a liquid/solid extraction process since the phytosterol is extracted from a solid phase.

KUTNEY *et al.* describe a process for isolating a phytosterol composition from pulping soap wherein the phytosterol composition is extracted from the pulping soap dissolved in a solution of water and a ketone, using a hydrocarbon solvent. In other words, KUTNEY *et al.* describe a liquid/liquid extraction process using multiple solvents (water, a polar organic solvent and a non polar organic solvent) to extract the phytosterols. Water is used as a co-solvent in the system and the soap is dissolved by the mixture of solvents used before extraction. In this approach, the simultaneous use of many solvents is necessary. Moreover, the use of a hydrocarbon solvent (*i.e.* hexane as exemplified in Example 1 and claimed in claim 4) to extract the phytosterol composition is an essential condition.

As mentioned previously, the Applicant's process is totally different since it uses a liquid/solid extraction to isolate phytosterol.

Moreover, in the process of the present invention, only one solvent is used to extract the phytosterol (*i.e.* a C₃-C₆ ketone or a C₁-C₆ alkanol). Such renders the process of extraction fundamentally different. The use of a single solvent has surprisingly allowed making very efficient phytosterols extractions. The most difficult step consists of the elimination of water in the beginning of the process. This is never taught in the prior art, which, on the contrary, uses water as a co-solvent in the process.

Furthermore, KUTNEY *et al.* require the use of a non-polar organic solvent, such as hexane, to extract the phytosterols. This is an essential condition in the KUTNEY *et al.* process. The present invention only uses polar organic solvents.

Thus, the Applicant respectfully submits that US patent No. 5,770,769 does not disclose the invention as recited in claim 1 and that the subject matter of claims 1-4, 7, 11-14 is novel over KUTNEY *et al.*

Rejection under 35 U.S.C. § 103(a)

On pages 3 and 4 of the outstanding Office Action, the Examiner has rejected claims 1-28 under 35 U.S.C. § 103(a) as being obvious over KUTNEY *et al.* in view of US patent No. 4,044,031 (hereinafter referred to as JOHANSSON *et al.*).

The Applicant respectfully contests this rejection for the following reasons:

JOHANSSON *et al.* describe a process for the recovery of sterols out of a unsaponifiable fraction by first dissolving such unsaponifiables in a water-immiscible solvent (such as hexane) or a solvent mixture and then extracting the polar components including sterols out of the solution using a methanol-acetone-water mixture (see col. 2, l. 11-19). Thus, like the KUTNEY *et al.* process, the JOHANSSON *et al.* process is a liquid-liquid extraction process.

As aforesaid, the Applicant's process as claimed is totally different since it uses a liquid/solid extraction to isolate the phytosterol.

Moreover, the prior art references both require the use of a non-polar organic solvent, such as hexane, to extract phytosterols/sterols. This is an essential condition in both processes.

The present invention only uses organic solvents and the use of such a non-polar solvent is not disclosed in the present invention.

Accordingly, the Applicant believes that it would not have been obvious to a person skilled in the art, in view of KUTNEY *et al.* and JOHANSSON *et al.* to use a liquid/solid extraction system as disclosed in the present invention, while

using only polar organic solvent(s).

Therefore, the Applicant respectfully submits that claims 1 to 28 should be considered as being neither anticipated nor obvious in view of the cited prior art references, and, as such, in condition for allowance.

CONCLUSION

In view of the foregoing, the Applicant is of the view that claims 1 to 28 are in allowable form. Favourable reconsideration and allowance of this application are thus earnestly solicited.

RESPECTFULLY SUBMITTED,

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